A new *Rheumatobates* from Costa Rica

(Hemiptera: Gerridae)

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The water strider described here was found in a mangrove swamp. The name is published so that it will be available for a forthcoming work on marine insects. For all measurements 60 units = 1 mm, except where given in mm.

Rheumatobates ornatus, n. sp.

Length, apterous male, 2.5 mm; macropterous forms unknown. Color deep brown to black; dorsum of thorax and abdomen mostly frosted. Posterolateral portion of thorax, head except median longitudinal black stripe, dorsum of first genital segment, connexival margins, orange brown. Broad medial area of pronotum, pleura, most of mesosternum, prosternum and venter of head yellowish to leucine. Antenna brown, lighter ventrally and on base of segment I. Fore femur basally, fore trochanter, posterior trochanter, yellowish brown; remainder of legs brown to deep brown. Rostrum brown.

Structural characteristics. Antenna, fore and middle legs of male modified. Antennal formula I–IV: male, 40:3:48:37; female, 23:4:27:26. Male antennal segment I as in Fig. 1e, with tufts of stout hairs basally on segment II directed caudally and ventrally, also long (7) stout curved spine directed ventrally at distal three-fourths on segment III (not visible in figure). Head (between eyes) of male long (30), broad (27); shorter (27) but equally broad (27) in female. Male abdominal dorsum broadly, transversely depressed, tergite II lowest; venter of segment VII modified to form a raised clasper (Figure 1a). Connexiva of male almost vertical, flatter in female. Male fore femur with a dorsal knob basally; middle trochanter with knob directed dorso-posteriorly; posterior trochanter with dorsal knob basally. Anterior tibia of male flattened, with two stiff leucine brushes distally, one dorsal, one ventral; adjacent to dorsal leucine brush is another brush of short stiff black bristles; tibia and tarsus modified as shown in Figure 1c, d. Middle femur of male highly modified, excavate above medially, ridged along entire length of caudal margin dorsally, set with two rows of recurved hairs plus several rows of stiff setae directed both anteriorly and posteriorly (Figure 1b); excavation with a brush of long, stiff black setae which are recumbent or obliquely posteriorly directed (not visible in figure). Acetabula of male excavate laterally, forming an oblique, almost vertical sulcus bordered anteriorly by a tumescence

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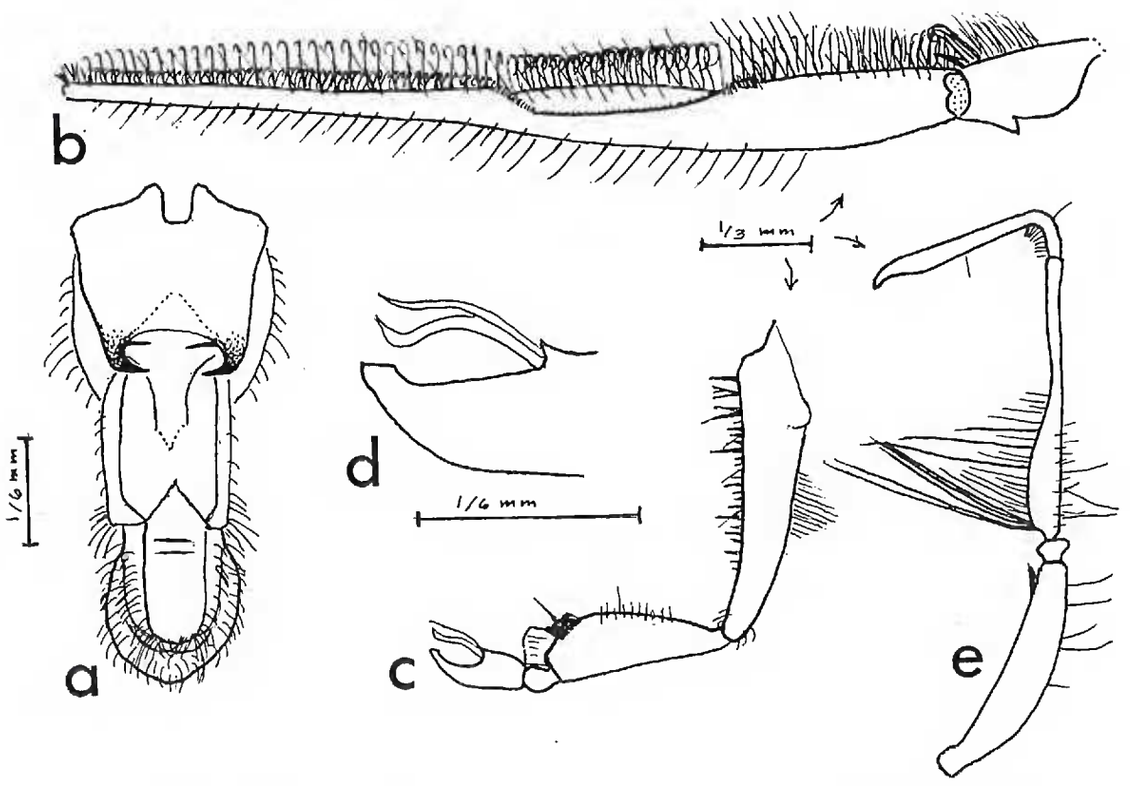

FIG. 1. *Rheumatobates ornatus* n. sp., male. a. Seventh abdominal and genital segments, ventral view. b. Middle femur and trochanter, dorsal view. c. Fore leg, dorsal view. d. Tip of fore tarsus and claws. e. Antenna, dorsal view.

bearing a brush of stiff posteriorly directed black setae, which overlay the sulcus.

Female similar to male in coloration; length (3 mm). Appendages without modification.

Material: *Holotype* (♂), *allotype* (♀), and *paratypes*, 31♂♂, 16♀♀, COSTA RICA, Mata de Limon, 29 Dec. 1974, L. Cheng. Holotype, allotype and 2 paratypes in California Academy of Sciences; paratypes in Polhemus Collection and Scripps Oceanographic Institution.

Discussion: This species is the only known *Rheumatobates* with an excavate and expanded middle femur, and it is not close to any described species. *R. crassifemur* Esaki and its subspecies have the middle femur swollen but not highly modified. The type locality is close to Puntarenas, and not far from Boca de Barranca; the latter is the type locality of another recently described *Rheumatobates* associated with the marine habitat (Polhemus, 1975).

Biological Notes: The mangrove swamp where *R. ornatus* was collected is quite extensive, and connected to the sea only at high tide. The insects were very abundant among the aerial roots of *Rhizophora mangle*, occurring in groups of 50–100. They came out in the open only when chased from the roots. Both adults and nymphs were present, and several mating pairs were captured. They were found with fish larvae

that occurred in great numbers in certain areas. The habitat as well as behavior of these skaters were very similar to those of *Rheumatobates aestuarius* Polhemus found in Baja California (see Cheng and Lewin, 1971).

LITERATURE CITED

CHENG, L. AND R. A. LEWIN. 1971. An interesting marine insect, *Rheumatobates aestuarius* (Heteroptera:Gerridae), from Baja California, Mexico. Pac. Ins. 13(2): 333–341.

POLHEMUS, J. T. 1975. New estuarine and intertidal water striders from Mexico and Costa Rica (Hemiptera:Gerridae, Mesoveliidae). Pan-Pac. Entomol. 51(3): 243–247.

SCIENTIFIC NOTE

Records of Rearing of Tachinids (Diptera) from Insects, Mostly in Washington.[1]—During the summers of 1965–7 numerous insects, largely Lepidopterous larvae, were collected in the vicinity of Pullman and elsewhere in Washington by Bert A. Freeman and reared at the laboratory in Pullman for determining their tachinid parasites and parasite-host relationships. Because of the illness of Mr. Freeman the project had to be terminated prematurely and was, consequently, incomplete. Considerable unpublished information was obtained, however, and this is presented here.

Various collecting methods were used, but in general larvae of different instars and sometimes pupae and adults were collected under natural conditions and brought into the laboratory where rearing was continued until the parasites emerged and until adult hosts were obtained for purposes of identification or confirmation of their identities. Winter collecting was made under loose bark and in leaf duff on the ground.

Some tachinid pupae do not seem very tolerant of artificial media or holding conditions and will not emerge unless natural conditions are closely simulated. For the most part, however, satisfactory results were obtained by exposing tachinid pupae to temperatures of 3° C for two months and then bringing them gradually out of the cold. For winter holding of tachinid and lepidopterous pupae sawdust from kiln-dried lumber proved the best. It could be made to hold sufficient moisture and, under eastern Washington conditions, very little fungous growth is encountered if the sawdust is changed every three or four weeks.

In the following annotated list common names are given only for insects other than Lepidoptera; lack of such indicates a lepidopterous host. Unless otherwise indicated the host is in the larval stage. Collections and rearing, unless otherwise indicated, were done by Mr. Freeman. Some information based on rearing of insects obtained other than in Washington is included. The order of listing is alphabetical by tachinid parasites. Dates are those of the collections of the hosts, not of emergence of the parasites.

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